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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,535	03/03/2004	Tom Francke	19200-000032/US	3362
30593	7590	06/10/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C.			SUCHECKI, KRYSZYNA	
P.O. BOX 8910			ART UNIT	
RESTON, VA 20195			PAPER NUMBER	

2882

DATE MAILED: 06/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/791,535	Applicant(s) FRANCKE ET AL.	
	Examiner Krystyna Suchecki	Art Unit 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>08/23/04;03/03/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

1. Inclusion of an arrow indicating the rotation of the detector array (6) in Figure 1 is recommended.

Claim Objections

2. Claims 16, 17 and 22 are objected to because of the following informalities:
Claims 16 and 17 are inconsistent in the use of singular and plural detector elements.
Claim 22 has a step of "to move," which should be "a relative moving step" or other similar language to show an active moving step. Appropriate correction is required.
3. Examiner notes that at least claim 1 contains intended ways of operating the device. While functional language is acceptable in the claims, Applicant should ensure the apparatus claims do not include methods of use.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
5. Claims 1-15 and 17-24 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for x-ray radiation, does not reasonably provide enablement for non X-ray systems. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. The claims have not been enabled for use with, for example, ultra-violet, infra-red or neutron detection systems.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-11, 15 and 18-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Gregerson (US 2004/0013225).

8. Regarding Claims 1 and 20, Gregerson teaches a scanning-based apparatus and method for obtaining tomosynthesis data of an object comprising a divergent radiation source (13) emitting radiation (15) centered around an axis of symmetry; a radiation detector (14) comprising a stack of line detectors, each being directed towards the divergent radiation source to allow a ray bundle of said radiation that propagates in a respective one of a plurality of different angles to enter the line detector (Paragraph 33); an object (Paragraph 32) area arranged in the radiation path between said divergent radiation source and said radiation detector for housing said object; a device (Paragraph 51) provided for moving said divergent radiation source and said radiation detector relative said object essentially linearly in a direction essentially orthogonal to said axis of symmetry, while each of said line detectors is adapted to record a plurality of line images of radiation as transmitted through said object in a respective one of said plurality of different angles; and a device (Paragraphs 38 and 35) provided for rotating said radiation detector an angle around an axis of rotation orthogonal to said axis of symmetry, the line

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detectors being, after said rotation, each directed towards the divergent radiation source to allow a ray bundle of said radiation that propagates in a respective one of a further plurality of different angles to enter the line detector, wherein said device (Paragraphs 38 and 51) provided for moving is further arranged to repeat the essential linear movement of said divergent radiation source and said radiation detector relative said object, while each of said line detectors is adapted to record a further plurality of line images of radiation as transmitted through said object in a respective one of said further plurality of different angles. Gregerson teaches the repetition of the “essential” linear motion since the source and detector are translated along a z-axis, which is orthogonal to the source axis of symmetry (Paragraph 51). The translation is “essential” and repeated in the sense that motion in a particular direction must be repeated, and is therefor essential, in order to complete the scan.

9. Regarding Claims 2 and 21, Gregerson teaches an apparatus and method wherein said axis of rotation is passing through said divergent radiation source (Paragraph 38).

10. Regarding Claim 3, Gregerson teaches the apparatus of claim 1 wherein said device for rotating is adapted to repeatedly rotate said radiation detector around said axis of rotation (Paragraph 38), the line detectors being, after each of said rotations, each directed towards the divergent radiation source to allow a ray bundle of said radiation that propagates in a respective angle to enter the line detector; and said device provided for moving is adapted, after each of said rotations, to repeat the essential linear movement of said divergent radiation source and said radiation detector relative said object, while each of said line detectors is adapted to record line images of radiation as transmitted through said object in a respective angle (Paragraph 51).

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11. Regarding Claim 4, Gregerson teaches the apparatus of claim wherein said line detectors are oriented to detect line images extending in a direction essentially orthogonal to said axis of symmetry and essentially orthogonal to the direction, in which said device for moving is provided to move said divergent radiation source and said radiation detector relative said object (Paragraphs 32-33).

12. Regarding Claim 5, Gregerson teaches the apparatus of claim 4 wherein said direction, in which said line images extend, is parallel with said axis of rotation, (Paragraph 32) [since the detection panel is flat, it is parallel with an axis of rotation].

13. Regarding Claim 6, Gregerson teaches the apparatus of claim 1 wherein said line detectors are oriented to detect line images extending in a direction essentially orthogonal to said axis of symmetry and essentially parallel with the direction, in which said device for moving is provided to move said divergent radiation source and said radiation detector relative said object; and said direction, in which said line images extend, is essentially orthogonal to said axis of rotation (Paragraph 32) [since the detection panel is flat, it is parallel with an axis of rotation and since it is an array, it is orthogonal].

14. Regarding Claims 7 and 23, Gregerson teaches an apparatus and method wherein said angle around said axis of rotation is smaller than a difference between two adjacent ones of said plurality of different angles (Paragraphs 33 and 38, Figure 2D). (Since the detector is smaller than the angular spread of the source beam, its translation within the beam plane results in an angular change that is smaller than an angle subtended by the source beam.)

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15. Regarding Claims 8 and 24, Gregerson teaches an apparatus and method wherein said angle around said axis of rotation is equal to, or larger than, an angular range, over which said plurality of different angles is distributed (Figure 2D).

16. Regarding Claims 9-11, Gregerson teaches the apparatus of claim 1 wherein said plurality of different angles is distributed over an angular range of at least 5, 10 or 15 Degrees (Figure 2D appears to have at least 5, 10 or 15 Degrees of angular spread).

17. Regarding Claims 15 and 22, Gregerson teaches an apparatus and method wherein said device for moving is adapted to move said divergent radiation source and said radiation detector relative said object a length which is sufficient for scanning each of said line detectors across the entire object to obtain, for each of said line detectors, a two-dimensional image of radiation as transmitted through said object in a respective one of said plurality of different angles (Paragraphs 32, 38-39 and 51-53).

18. Regarding Claim 18, Gregerson teaches the apparatus of claim 1 wherein said line detectors are each any of a diode array, a scintillator-based array (Paragraph 57), a CCD array, a TFT- or CMOS-based detector, or a liquid detector.

19. Regarding Claim 19, Gregerson teaches the apparatus of claim 1 comprising a collimator (Figure 11) arranged in the radiation path between said radiation source and said object area, said collimator preventing radiation, which is not directed towards said line detectors, from impinging on said object, thereby reducing the radiation dose to said object.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 12-14, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gregerson in view of Boyd (US 4,075,492).
22. Regarding Claims 12-14, Gregerson teaches a divergent radiation source as an X-ray source (Paragraph 32) and a plurality of detectors in an array (Paragraphs 32 and 57) so as to make up a stack on lines. Gregerson also teaches alternative, and 'typical' detector arrangements (Paragraph 57).
23. Gregerson fails to teach the number of line detectors in said stack of line detectors as at least 3, 10 or 25. Gregerson also fails to teach that the line detectors are each gaseous-based electron avalanche ionization detectors, wherein electrons freed as a result of a respective ray bundle are accelerated in a direction essentially perpendicular to the direction of that ray bundle.
24. Boyd teaches 150 individual detecting elements arranged in lines (Column 4, lines 9-19) to make up a stack of gaseous-based electron avalanche ionization line detectors (Column 5, lines 23-64). The number of lines and angular positions for data collection create an arrangement that allows for tomographic imaging with an increased count rate for time sensitive measurements (Column 6, lines 18-49).
25. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the gaseous-based electron avalanche ionization detectors of Boyd in the device of Gregerson in order to have a number of line detectors in said stack of line detectors as at least 3, 10 or 25 (Boyd, Column 4, lines 9-19) so that

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time sensitive tomographic imaging data can be obtained with an increased count rate (Boyd, Column 6, lines 18-49).

Conclusion

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patent to DiBianca (US 6,335,957) teaches the benefits of tilting the detector array to image resolution in classical tomography systems. Patent to Nambu (US 6,196,715) is of interest for teaching the rotation of a curved detector array to track a source of radiation (Column 32, lines 58-64). Patent to Bernardi (US 4,969,165) is of interest for teaching a slanted detector array that can be oriented to track the angle of radiation. Patent to Barnes (US 4,315,157) is of interest for teaching detector rotation between detector and source translations (Column 1, lines 40-47).

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (571) 272-2495. The examiner can normally be reached on M-F, 9-5.

28. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

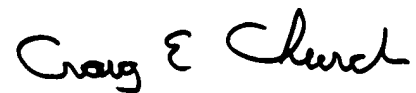
29. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you

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have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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Craig E. Church
Primary Examiner